

DISABILTYAND ASSISTIVE TECHNOLOGY

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ABSTRACT

There are nearly one billion people with disabilities all over the world and more than a hundred million people have heavy disabilities and need assistance (WHO, 2012). Disability is not a fault and people with disabilities are a part of our community and have equal rights with us. According to United Nations Convention on the Rights of Persons with Disabilities (CRPD) (2006), providing assistance to disabled people to maximize functioning, support independence and, participate in the community is the duty of governments.

The Assistive Technology is an umbrella term that covers many technologies, devices or only methods to support people with disabilities. The assistive technology varies from a low-tech pen grip to a high-tech multi-touch tablet pc. The common point of all is removing the barriers in front of the disabled people (The Disability Act, 2004; CRPD, 2006; World Report on Disability, 2011; WHO, 2012)

Introduction

According to World Health Organization (WHO) (2012), nearly %15 of the world's population has different disabilities. Between 110 – 190 million of them have disabilities that cause significant difficulties in functioning. Furthermore, this number is increasing related with the population ageing and global increase in chronic health conditions.

World Report on Disability (2011) mentions that many of these people with disabilities do not have equal chance to access education, health care and employment opportunities. Many people with disabilities need assistance and support to go on their daily life and participate in social and economic life. But, they could not achieve these goals, due to lack of assistive services. Moreover, people with disabilities experience worse socioeconomic conditions and poverty than people without disabilities. As United Nations Convention on the Rights of Persons with Disabilities (CRPD) (2006), mentioned that people with disabilities are a part of human diversity and humanity. And, they should have equal opportunity and accessibility with people without disabilities.

Governments have responsibility to support people with disabilities and provide opportunities to remove the barriers related with their disabilities (CRPD, 2006). But, first of all it should be defined that what disability is.

What is disability?

WHO (2012) defines disability as:

Disability is an umbrella term covering impairments, activity limitations, and participation restrictions. Impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations.

Republic of Turkey Prime Ministry Administration for Disabled People (2005) defines person with disability as:

Disabled is the person who has difficulties in adapting to the social life and in meeting daily needs due to the loss of physical, mental, psychological, sensory and social capabilities at various levels by birth or by any reason thereafter and who therefore need protection, care, rehabilitation, consultancy and support services.

Types of Disabilities

World Report on Disability (2011) states that disability is a complex and multidimensional situation that has several adversities to measure. Approaches, which are used to measure the disability, differ from one country to another. Operational measurement of disability diversify according to several variables such as the purpose, application of data, the concept, the examined aspect of disability, the definition, design of the study and questions, sources that used to report, data collection method, and expectations. Actually, there are not certain types of disability. It has become a part of daily language due to some surveys that

seek to determine different types of disability. Generally, the term, “types of disability”, is used to define only one aspect of disability such as impairments and is conflated other health conditions. Mostly, people with chronic health conditions, communication difficulties, and other impairments do not added to disability list.

On the other hand, Republic of Turkey Prime Ministry Administration for Disabled People (2012) divides disability into six categories: orthopedic disability, seeing disability, hearing disability, speaking disability, mental disability, and chronic illness.

Orthopedic Disability: People, who have inadequacy with muscles, anatomic problems, lost any part of his/her body, belong to this group.

Seeing Disability: People, who lost their seeing ability, partially or totally, are the main members of this group. Moreover, people using prosthesis eye, color blind and moon blind are the members of this group, too.

Hearing Disability: People who lost their hearing ability, partially or totally, are the main members of this group. Moreover, people using hearing instrument are the members of this group.

Speaking Disability: People who cannot speak due to any reasons, or have problems with the fluency of the speech or sound are the members of this group. Moreover people who can hear but cannot speak, use devices to speak, stemmer, tongue-lips-palate-chin problems are the members of this group, too.

Mental disability: People who have lack of mental ability belong to this group. Mental retardation, Down syndrome and Phenylketonuria (if caused mental retardation) patients are the members of this group, too.

Chronic Disease: People who have a chronic disease that obstruct their daily life such as blood diseases, cardiovascular system diseases, urinary system diseases, endocrine diseases, cancers, metabolic diseases, neurologic diseases, AIDS are belongs to this group.

Number of People with Disabilities

According to WHO (2012) almost 15% of the world population, nearly 1 billion people, have disabilities. 110 – 190 million people have significant disabilities that affect their daily life negatively. Number of people with disabilities is increasing permanently related with the aging of population and the global increase in chronic health conditions.

The ratio of people with disability to population in our country, Turkey, is a bit less than world average. While world average is 15%, it is 12.29% in Turkey. There are 8.431.937 people who have disabilities in Turkey. While the ratio of people with orthopedic disabilities, seeing disabilities, hearing disabilities, speaking disabilities, mental disabilities is 2.58%, nearly 1.8 million people, the ratio of people with chronic diseases is 9.7%, nearly 6.6 million of people (Republic of Turkey Prime Ministry Administration for Disabled People, 2012).

In addition to former information, education level of people with disabilities is too low. 41% of people with disabilities graduated from primary school. This ratio increases to 47.1% within the people with chronic disease. Only 2.24% of people with disabilities continue to higher education. This ratio is 4.23% for people with chronic disease. Education level is a parameter that affects the quality of life. The ratio of health care, employment opportunities, income and participation to socioeconomic life are positively correlated with the education level. Disability is a factor that prevent to continue education, its' results increase the load of being disabled. This vicious circle could be broken down by increasing the availability, the accessibility and the quality of special education to disabled people; and, by giving chance to disabled people, who can, to attend regular education. This could only happen, if only the socially conscious will be increased and the legal arrangement will be done to provide equal opportunities under the control of government (Republic of Turkey Prime Ministry Administration for Disabled People, 2012).

Policies about Disabled People

In 1998, US Government Congress amended the Rehabilitation Act of 1973. This act requires that all Federal agencies should have accessible electronic and information technology to people with disabilities. Inaccessible technology blocks the easy, quick and effective usage of information. Section 508 is charged with removing barriers in information technology, open new opportunities to disabled people, and support technologies that facilitate these aims. Moreover, agencies should give the number of employees with disabilities and members of the public access to information (Section508.gov).

The Convention on the Rights of Persons with Disabilities (CRPD) was proposed by the United Nations in 2006 and signed by nearly 150 countries and regional integration organizations. And, the convention has been ratified by 100 of them (WHO, 2012).

The Academic Network of European Disability experts (ANED) was founded in 2008 by the European Commission to obtain scientific support and advice for its disability policy unit. Moreover, it is charged with supporting the future developments of European Union Disability Action Plan and the practical implementation of the United Nations Convention on the rights of Persons with disabilities. The philosophy and the objective of the ANED is supporting all disabled people to participate fully and have equal opportunities (ANED, 2012).

One of the main problems of people with disabilities is full participation into education system. All countries are disturbed because of this situation; so that they make policies to change this situation to in favor of people with disabilities. One of the examples is European Union's Council Resolution of 31 May 1990 concerning integration of children and young people with disabilities into ordinary systems of education (90/C162/02). According to this Council Resolution, each member of European Union should include the disabled people into education by taking into consideration their educational system. Moreover, disabled people should be supported during their whole education life and all education institutions should be revised to remove barriers to disabled people. Furthermore, providing the necessary equipment and assistive technologies are the duties of governments (Republic of Turkey Prime Ministry Administration for Disabled People, 2012).

One of the most important steps is the Turkish Disability Act which was signed in 2005. According to the Turkish Disability Act (2005) "The right of education of disabled people cannot be prevented for any reason. They must be provided with equal education with disabled people and in inclusive environments by taking the special conditions and differences into consideration". Moreover, the Higher Education Council (YÖK) 2006 directive, each university has to have a Disability Coordination Unit; so that students with disabilities can apply to unit to get suitable support. Moreover, each university is responsible for providing necessary assistive technologies to students with disabilities (Republic of Turkey Prime Ministry Administration for Disabled People, 2012). Furthermore, assistive technology has an important role in special education that many students with disabilities need special instructional treatment and technologies related with that (Sze, 2004).

Assistive Technology

The Assistive Technology was defined as "Any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (The Assistive Technology Act, 2004). The Assistive Technology Act (2004) was signed in October 25, 2004 by the US Government. The first Assistive Technology law was the Technology Related Assistance for Individuals with Disabilities Act which was signed in 1988, by US Congress. The importance of the Act was that it was the first official document that defines the Assistive Technology, devices and services (Tech Act, 2004).

Similar to the Assistive Technology Act (2004), Disability.gov (2012) defines the Assistive Technology as "Any device, piece of equipment, product or system that helps people with disabilities fully participate in school, the workforce or in their communities." (Disability.gov, 2012). Wheelchairs, walkers, software, hardware and computer accessories are some examples of assistive technologies. Assistive devices and technologies are the devices or software that increases mobility, hearing, mobility, vision, communication capacities. People with different disabilities have chance to have independent life and participate the society (WHO, 2012).

AccesIT (2012) has a broader and up to date definition of the Assistive Technologies:

Assistive technology is technology used by individuals with disabilities in order to perform functions that might otherwise be difficult or impossible. Assistive technology can include mobility devices such as walkers and wheelchairs, as well as hardware, software, and peripherals that assist people with disabilities in accessing computers or other information technologies. For example, people with limited hand function may use a keyboard with large keys or a special mouse to operate a computer, people who are blind may use software that reads text on the screen in a computer-generated voice, people with low vision may use software that enlarges screen content, people who are deaf may use a TTY (text telephone), or people with speech impairments may use a device that speaks out loud as they enter text via a keyboard.

According to Coleman (2011) "AT can be anything that helps a student with a disability perform a task that he or she otherwise would not be able to perform or to increase the efficiency with which the task is performed. Even simple, everyday items can be AT". For example, a piece of scotch tape that holds the paper stable for a student who has only one hand becomes an Assistive Technology.

Assistive Technologies can be in several forms such as no-tech, low-tech, and high-tech. No-tech assistive technology means using strategies that provide opportunity to learner instead of technology such

as extended time, colored folders, chunking materials, and index cards. Low-tech assistive technology means using straightforward tools such as simple speakers, adapted scissors, raised-lined paper, step-by-step picture schedules, pencil grips, paper communication boards, calculators. High-tech assistive technology means using especially computer or computer components such as specialized software and advanced hardware devices (Poel, 2007; Floyd, Canter & Judge, 2008; Coleman, 2011).

Technology has been using for centuries to facilitate life of people with disabilities such as a cane or stick that helps visual impairments (Kelly & Smith, 2011). There was always a need to devices to remove disabilities. For example, telephone was invented by Alexander Graham Bell while trying to help hearing impairments whose wife and mother were both hearing disabled people (Mueller, Jones, Broderick & Haberman, 2005).

The rapid developments in information and communication technologies have already affected our life. People can access the information without any time and space limitations. Especially related with the development of mobile technology everything is accessible at anytime from anywhere. These technologies simplify the life for people both with and without disabilities (Kuzu, 2011).

In the past decade, mobile technology has experienced an impact. MP3 players, digital cameras, GPS devices, PDAs, and so more technologies have become a part of our daily life. Furthermore, at the end they have become an only device, smartphone. A smartphone is a device that has other functions than being a phone and has its own operation system that allows installing programs to increase the usable functions of the device (Forf & Rabe, 2011; Kuzu, 2011;).

The Study of Ford & Rabe (2011) shows that, using smartphones or devices with similar properties have a significant positive effect on disabled people. Being adaptable, having access from anywhere and anytime are the biggest positive aspects of these devices (Forf & Rabe, 2011). On the other hand, these are very expensive devices that most disabled people cannot afford; so they need funding. According to CRPD (2006) governments should provide these assistive technologies to disabled people to facilitate their life and support participation to socioeconomic life.

According to CRPD (2006), Turkish Disability Act (2005) and, ANED (2008) each disabled student has right to access assistive technologies related with his/her needs. Assistive technologies are being used by many schools to enrich the educational medium especially for the students with disabilities. However, most of the assistive technologies are too expensive to acquire for schools and individuals. According to Turkish Disability Act (2005), government is responsible for providing these technologies to individuals. Moreover there is another problem with assistive technologies. Except some standard equipment, such as wheelchair, crutch, staff, most of the devices should be produced for its owner based on needs. Moreover, those standard devices need to be adjusted. There is no "one fits all" approach for AT selection (Simpson, McBride, Spencer, Lowdermilk & Lynch, 2009).

Conclusion

People with disabilities are a part of our community and they should not be excluded. The assistive technologies are the way of their connection to community. They can walk, speak, hear or communicate via AT. Even though they need, most of them they could not afford it. Governments are responsible for providing AT for them. Nevertheless, according to World Report on Disability (2011) most country does not have such technologies.

Related with the rapid change in technology, accessibility and communication become much easier than before (Ford & Rabe, 2011). The high speed internet connection, especially with the contribution of wireless and 3G technologies, people can access information anytime and anywhere. These technologies should be used as assistive technologies to remove barriers, so that, more people with disabilities can become a real part of community.

Lastly as a general overview to assistive technologies Borg, Larsson and Östergren (2010) proposed these points of interest of Assistive technology;

- Using of Assistive Technology can enhance the ratio of participation, but these technologies are not available in many countries.
- Measuring the prevision and usage of the Assistive Technologies is a requirement to Countries signed the Unites Nation's Convention on the Rights of Persons with Disabilities (CRPD).
- Measuring the Assistive Technologies by using the CRPD is not possible, due to lack of explicit measures and not covering all human rights or people with disabilities
- The principle of non-discrimination suggests that all people with disabilities have a right to demand available and affordable Assistive Technologies to assure their enjoyment of all human rights.
- Supplying the Assistive Technologies to people with disabilities is a national responsibility as well as an international responsibility.

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